

Remarks/Arguments:

The applicants note with appreciation the Examiner's allowance of claims 16-20 and indication that the subject matter of claim 4 is allowable.

35 U.S.C. § 121

The Examiner has issued a restriction requirement to the following Groups:

- I. Claims 1-4 and 16-20, drawn to a ceramic bias fiber holder and a loom using the holder, classified in class 139, subclass 448; and
- II. Claims 5-15, drawn to a 3-D weaving loom, classified in class 139, subclass 11.

The Examiner also correctly noted on page 3 of the Office Action that the applicants provisionally elected, with traverse, Group I during a telephone conversation on 6/2/2004. The applicants note that, during this conversation, the Examiner indicated that claim 16 may be generic to the two claim groups. Based on this information, the applicants provisionally elected Group I. During a separate Examiner-initiated telephone interview on June 8, 2004 to discuss the examination of the claims in Group I, however, the Examiner informed the applicants that the restriction was of the combination/subcombination type. Therefore, no generic claim was presented. The substance of the interview is included as an attachment to this response.

The applicants hereby respond to the Examiner's restriction requirement with alternatives in descending order of the applicants' preference:

Alternative 1

On further review of the pending claims, the applicants seek modification of the restriction requirement and therefore respectfully request the Examiner consider modifying the restriction. See 37 C.F.R. 1.143, MPEP 818.03.

By way of modification, the applicants propose that the pending claims of Group I and Group II be rearranged to better consolidate similar claims. The applicants suggest the following new grouping:

- I. Claims 1-4, drawn to a ceramic bias fiber holder; and
- II. Claims 5-20, drawn to a 3-D weaving loom and a 3-D weaving loom using a ceramic bias fiber holder.

The applicants urge that the proposed grouping better delineates the claimed subject matter. The shift of claims 16-20 to Group II unites claims 9-10 with claims 16-20. This is preferable because each of claims 9,10, and 16-20 describe, inter alia, a 3-D loom employing a ceramic bias fiber holder. The proposed grouping would allow all the currently pending claims directed to a 3-D loom using a ceramic bias fiber holder to be prosecuted together. The proposed grouping would "[reduce] work . . . by simplifying the issues." MPEP 819.01.

If the Examiner finds this proposed claim grouping acceptable, the applicants elect proposed Group II without traverse.

Alternative 2

As a second and less preferable alternative, the applicants respectfully request permission to diverge from their provisional election of Group I to instead formally elect Group II. The applicants apologize for inconvenience to the Examiner but respectfully note for the record that the original telephone election was made prior to the change in restriction requirement that occurred between June 2, 2004

and June 8, 2004. The applicants are prepared to make this election of Group II without traverse.

Alternative 3

If the Examiner is unwilling to reform the restriction requirement as suggested by the applicants in response Alternative 1, and insists that the applicants maintain their provisional election of Group I, the applicants will elect Group I without traverse.

35 U.S.C. § 103

Fully responsive to the Office Action, the applicants have amended claim 1 to address the obviousness rejections of claims 1-3 based on U.S. Patent No. 4,615,256 issued to Fukuta et al. (Fukuta) in view of U.S. Patent No. 5,347,743 issued to Tokuda et al. (Tokuda). It is respectfully submitted that claim 1, as amended, is patentable over Fukuta and Tokuda for the reasons set forth below.

Fukuta discloses a method and apparatus for forming a three-dimensional woven fabric. An embodiment described by Fukuta at Figure 18 employs a "modified version of [a] carrier arm." Fukuta col. 11, lines 47-66. This "carrier arm" uses a "suction path 81" to feed desired yarn to a "yarn holding recess 82 near the leading end of the arm piece 80." Fukuta col. 11, lines 51-56. The yarn is then captured **mechanically** by a "tubular sheath 83" which slides towards the leading end of the "arm piece 80" via an "electromagnet or a hydraulic cylinder." Fukuta col. 11, lines 58-65 (emphasis added). Thus, it can be discerned that the modified carrier arm of Fukuta uses suction for the purpose of **feeding yarn** that is later captured mechanically.

Tokuda discloses a ceramic "guide ring 2" depicted in Figures 1-3. Tokuda col. 4, lines 52-63. Tokuda does not disclose or suggest a vacuum cylinder.

The applicants respectfully submit that the present invention, as recited in claim 1, contains a feature which is neither disclosed nor suggested by Fukuta and Tokuda, individually or in combination, namely "a ceramic vacuum cylinder to hold a bias fiber under constant vacuum tension." This feature, which is illustrated in Figure 3, is distinguished from the modified carrier arm of Fukuta (Figure 18) and the guide ring of Tokuda (Figures 1-3). Instead, the applicants disclose a bias fiber holder as the following:

Fig. 3 is a more detailed illustration of the bias fiber holder 212 and a bias fiber arm 210, which are used to handle and tension the +45° bias fibers 106. Because the +45° bias fibers 106 are relatively short, they may be cut to length before introduction into the weave. The +45° bias fibers 106 are maneuvered in and around the weave by carrying them in tubes 304. Each tube 304 is preferably slightly longer than the longest +45° bias fiber 106. The tube 304 has a vacuum port 308 at one end and a ceramic lining 306 at the other end. A length of +45° bias fiber 106 is loaded into the tube 304 at the ceramic-lined end and drawn into the tube 304 by applying a vacuum to the vacuum port 308. The flow of air between the +45° bias fiber 106 and the ceramic lining 306 at the front of the tube 304 creates a nearly constant tension on the +45° bias fiber 106. The vacuum is preferably supplied by connection of the vacuum port 308 to the bias shuttles 208, 209.

Application page 14, lines 5 to 16 (emphasis added).

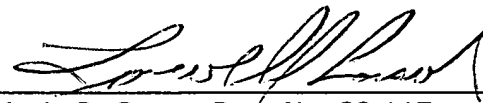
The applicants respectfully submit that, at best, Fukuta and Tokuda teach a ceramic vacuum feed device. The present invention is capable of maintaining a substantial tension on the bias fiber by applied vacuum rather than mechanical capture.

Therefore, for the reasons set forth above, claim 1, as amended, is not subject to rejection under 35 U.S.C. § 103(a). The subject matter recited in

amended claim 1 would not have been obvious to a person of ordinary skill in the art at the time of the invention in view of Fukuta, Tokuda, or the combination of those two references. Because claims 2-4 are dependent on claim 1, these claims are not subject to this rejection as well.

In view of the amendments and arguments set forth above, the applicants respectfully submit that the claims as amended are in condition for allowance. Early and favorable notification to this effect is respectfully requested.

Respectfully submitted,



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Attachment: Substance of the Interview

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September 15, 2004



Lowell L. Carson



Substance of the Interview

Examiner Robert J. Muromoto, Jr. initiated a telephonic interview with Applicants' representative, Lowell Carson, on June 8, 2004. In this interview, the Examiner set forth his position that claims 16-20 were allowable and that claim 4 also included allowable subject matter, but that claims 1-3 were obvious in view of the prior art. The Examiner suggested that if claim 1 were amended to include the features of dependent claim 4, and then claim 4 canceled the application would be in condition for allowance.

Although he had not had time to fully analyze the prior art, Mr. Carson agreed that the inclusion of the features of claim 4 into claim 1 would be acceptable, but only if this amendment lead to the allowance of all of the pending claims, including claims 5-15. Regarding claims 5-15, Mr. Carson noted that in a separate telephone conversation on June 2, 2004, the provisional election of claims 1-4 and 16-20 was made with traverse, but at that time the Examiner indicated that he would consider whether claim 16 was generic to the two claim groups.

The Examiner informed Mr. Carson that after further reviewing the claims, he felt that a restriction based on separate species was improper and that restriction requirement was made based on the two claim groups being related as combination and subcombination. Therefore, no generic claim is possible to link the claim groups.

Based on this information regarding the restriction requirement, Mr. Carson was unable to agree to the Examiner's offer to enter an Examiner's amendment to claims 1 and 4. He, therefore, requested that the Examiner issue an Office Action.